5.8 Paleontological Resources

This section addresses the potential for impacts to occur to paleontological resources (fossils) from the construction and operation of the proposed Rice Solar Energy Project (RSEP), and identify possible mitigation measures that would be needed to reduce or eliminate any potential significant impacts. This section has been prepared in accordance with the California Energy Commission's (CEC) Power Plant Site Certification Regulations (CEC, 2007) and conforms to the recommendations of the Society of Vertebrate Paleontology (SVP, n.d.) regarding the assessment and mitigation of impacts to paleontological resources resulting from earthmoving activities.

Section 5.8.1 describes the existing environment that could be affected and the potential for sediments containing significant fossil remains to be within the area of potential effect from earthmoving activities associated with construction of the RSEP. Section 5.8.2 identifies potential environmental effects, if any, from project development. Section 5.6.3 discusses potential cumulative effects. Section 5.6.4 discusses possible mitigation measures to reduce or eliminate adverse impacts to paleontological resources at the project site and linear appurtenances. Section 5.6.5 presents the laws, ordinances, regulations, and standards (LORS) applicable to paleontological resources. Section 5.6.6 lists the agencies involved with paleontological resources. Section 5.6.7 discusses permit requirements, and Section 5.6.8 provides the references used to develop this section.

This section of the AFC considers the potential for sediments containing significant fossil remains to be within the area of potential effect from earth moving associated with construction of the RSEP project. The electrical transmission line route extends the impact zone beyond the RSEP project site, but the geology and paleontological potential does not differ substantially. This section only addresses impacts associated with the construction phase of the project; operation of the RSEP facility will not involve further ground-disturbing activities, and therefore no impacts to paleontological resources would occur during the operational phase of this project.

This section of the AFC summarizes the potential environmental impacts on paleontological resources that may result from construction of the RSEP. This paleontological resources inventory and impact assessment was conducted by Dr. Geoffrey Spaulding, a senior paleontologist with CH2M HILL. Dr. Spaulding has advanced degrees in geology with emphasis in paleobiology, and is a recognized expert on the glacial-age environments of the American West. He previously has completed paleontological resource surveys and prepared paleontological resource impact assessments in support of energy-generation and other large construction projects throughout California and adjacent states. Of relevance to this project, he is a recognized expert on Quaternary processes in the American deserts, and holds statewide U.S. Bureau of Land Management (BLM) paleontological resources use permits for California and Nevada.

5.8.1 Affected Environment

Paleontological resources (fossils) are the remains or traces of prehistoric plants and animals. They may range from the actual bones and shells of ancient organisms, to mineral replacements of a once-living organism, to impressions of plants or animals in soft

sediments later transformed to rock. They range in size and abundance from many thousands per cubic centimeter for microfossils such as pollen, diatoms, and radiolaria, to rare large-mammal bones exceeding a meter in length. Fossils are important scientific and educational resources because of their use in (1) documenting the presence and evolutionary history of particular groups of now-extinct organisms, (2) reconstructing the environments in which these organisms lived, and (3) determining the relative ages of strata in which they occur and the geologic events that resulted in the deposition of the sediments that formed these strata. In Riverside County, the fossils of marine organisms and those of terrestrial animals and plants are important in the paleontological record (Riverside County, 2009a).

5.8.1.1 Physiographic Setting

The RSEP site, and the first several miles of the proposed new transmission line are located on the southern bajada[1] of the Turtle Mountains. The last approximately 5 miles of the transmission line are located in very similar habitat near the toe of the bajada extending west from the West Riverside Mountains (Figure 5.8-1). The entire project area is on the northern and northeastern portion of Rice Valley. Rice Valley is an intermountain basin in the arid Sonoran Desert of eastern Riverside County, California. In Riverside County, the fossils of marine organisms and those of terrestrial animals and plants are important in the paleontological record (Riverside County, 2009a).

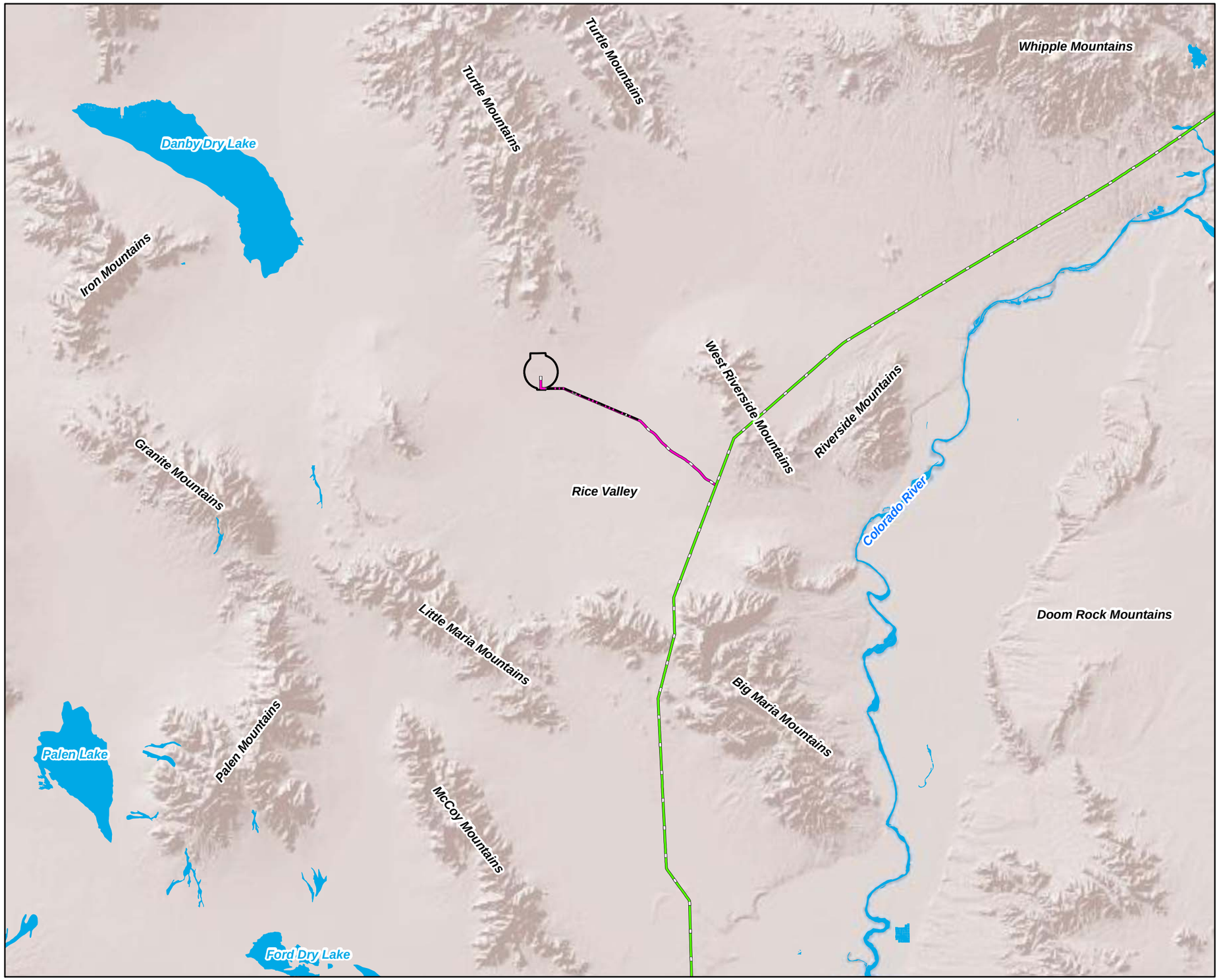
The project area lies in the Basin and Range physiographic province of the interior West (Fenneman, 1931), eponymously typified by large basins separated by intervening mountain ranges. In most portions of the west these mountains and valleys are oriented generally north-south, but this is not necessarily the case in the project area due to differences in the direction of crustal deformation here than elsewhere in the Basin and Range. The zone of anomalous deformation through this region is called the Maria Fold and Thrust Belt (Glazner et al., 1994). The extension and then rotation of crustal blocks in this area, partly a consequence of proximity to the San Andreas Fault Zone, resulted in many mountain ranges that have an east-west rather than north-south orientation. The physiography of this area is therefore best characterized as being one dominated by many smaller mountain ranges surrounding large valleys.

The Rice Valley is bounded by the Turtle Mountains to the north, the West Riverside Mountains to the east, the Big Maria and Little Maria Mountains to the southeast and southwest, respectively, and the low Arica Mountains to the west. The valley axis is oriented generally west-northwest to east-southeast with relatively low alluvial sills separating it from the Danby Dry Lake basin to the northwest, and the Colorado River Valley to the southeast. Elevations range from approximately 690 feet above mean sea level (amsl) in the valley bottom about 1.75 miles south of the project area, to 740 and 930 feet amsl on the south and north boundaries of the project area on the Turtle Mountains bajada, respectively.

5.8.1.2 Resource Inventory Methods

Published and available unpublished geological and paleontological literature was sought for the project area to develop a paleontological resource inventory, and to assess the paleontological sensitivity of the stratigraphic units present. Sources searched for included

[1] A bajada is the ramp of alluvium that extends from the axes of southwest desert valleys to the piedmonts of surrounding mountain ranges, and is composed of coalescing alluvial fans.



LEGEND

- TRANSMISSION LINE ACCESS ROAD
- GENERATOR TIE-LINE
- PARKER-BLYTHE TRANSMISSION LINE
- PROJECT FENCELINE BOUNDARY

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

N

0 2.5 5
Miles

FIGURE 5.8-1
PHYSIOGRAPHIC SETTING
RICE SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA

CH2MHILL

SAC\\ZION\SACGIS\PROJ\SOLARPROJECTS\SOLARRESERVE_377714\MAPFILES\PHYSIOGRAPHICSETTING.MXD MHASKELL 10/13/2009 16:47:30

geological maps, satellite photography, technical and scientific reports, and assessments of existing conditions in relevant environmental documents. These tasks were conducted in compliance with CEC (2000, 2007) and SVP (n.d.) guidelines for assessing the importance of paleontological resources in areas potentially impacted by construction-related excavations.

A paleontological records search for the RSEP was requested from the San Bernardino County Museum (SBCM). Additionally, the online utility offered by the University of California Museum of Paleontology at Berkeley was searched using keywords that included geographically relevant designators. Internet searches were also used to identify relevant paleontological and geological literature, and remote imagery of the area was examined using Google Earth™. Finally, Riverside County's (2009b) paleontological sensitivity map was consulted. These investigations did not result in the identification of previously discovered fossil finds within a mile of any of the project facilities. For this reason, we have not prepared a map as required by the CEC's Siting Regulations, Appendix B (g)(16)(D) when such resources are present.

A reconnaissance-level paleontological survey was conducted by the project paleontological resources specialist, Dr. Geoffrey Spaulding, on June 23 and 24, 2009. This field review included the RSEP site and the eastern Rice Valley and, with the remote imagery analysis noted above, focused on determining whether paleontologically sensitive sediments were present in the area. No comprehensive paleontological survey was conducted because the ground surface throughout consisted of low-sensitivity alluvium or eolian sands. In addition, two trenches were excavated for geotechnical investigations at the project site, and the exposed strata were examined and diagrammed by Dr. Spaulding.

5.8.1.3 Resource Inventory Results

The history of sedimentation in the Rice Valley during the Neogene (the last 35 million years) has been governed by local tectonism, and by regional changes in the attitude of the North American craton relative to the Pacific Plate (Sherrod and Tosdal, 1991). The Turtle Mountains represent the only bedrock outcrops in the vicinity of the project, and their closest outcrops lie about 1.2 miles to the north. They are composed of Precambrian metamorphic and igneous rocks (Bishop, 1963), and possess no paleontological sensitivity. Along with eolian sand and silt, clasts of these Precambrian rocks form the alluvial substrate of the project site. Field reconnaissance revealed that the closest outcrops of fossiliferous sediments in settings similar to the project area are about 13 miles to the northeast, where outcrops of the Mio-Pliocene Bouse Formation are found on the western edge of the Colorado River Valley. The records search results from the SBCM, received July 20, 2009, Appendix 5.8A), also reveal no paleontological records in the vicinity of the project site.

Late Quaternary lacustrine and paleospring sediments are among the most common fossiliferous sediments in this desert region (e.g., Quade et al., 1995; Jefferson, 2003), but neither occur near the project site or the transmission line. Evidence of a pluvial lake is abundant in the Danby Dry Lake Basin, about 13 miles to the west-northwest, but there is none readily apparent in the Rice Valley. Previously unrecorded paleospring deposits were found along Blythe-Midland Road, about 5.5 miles south-southwest of the project area, but none have been located closer than that. The county's paleontological sensitivity map (Riverside County, 2009b) shows that Rice Valley is surrounded with uplands possessing "Low" paleontological sensitivity, with the lower slopes of the valley where the project site

is located possessing "Undetermined" paleontological sensitivity. A small area along the valley axis, and more than a mile distant from the project including the transmission line right-of-way, is mapped as possessing "High" paleontological sensitivity.

5.8.1.4 Sediments Present or Within 1 Mile of the Project Site

The geological units within 1 mile of the project site and the transmission intertie are Quaternary alluvium, and eolian sand sheets and dunes. In addition, locally derived fill and previously disturbed sediment mantles the project area to varying depths. The geological units are described also in Section 5.4, Geological Hazards and Resources, and a map of the geological units within 2 miles of the project site is found in that section as Figure 5.4-1.

5.8.1.4.1 Pleistocene Alluvium

The alluvial fans that extend south from the Turtle Mountains carry primarily fine-grained clasts (coarse gravel and finer clastic sediment) by the time it reaches the project area. Older and coarser-grained boulder trains can be seen to the west of the project area, but at the plant site the alluvium is uniformly fine-grained. This is also the case for the distal portion of the bajada that extends southwest from the West Riverside Mountains that is crossed by the proposed electrical transmission line.

The stratigraphy of the geotechnical trenches revealed a pattern of soil formation typical of Pleistocene sediments in this area. Holocene eolian sands and silts comprise the top 5 to 10 centimeters (cm) followed by flat-lying, coarsely bedded coarse gravelly sand with gravel stringers overlying a distinctly reddened argillic horizon at 35 to 60 cm depth. The argillic horizon itself overlies a silt, sandy gravel possessing a Stage II+ carbonate morphology at depths exceeding 60 cm. Both the nature of the sediment and the soil development, typical of alluvial fan surfaces in the xeric western deserts (e.g., McFadden et al., 1991), indicate low to no paleontological sensitivity. This is due not only to the subaerial deposition of the alluvium, but also to the intense chemical weathering associated with this type of soil development.

5.8.1.4.2 Eolian Sand Sheets and Dunes

Rice Valley possesses spectacular sand ramps that practically cover the flanks of the Big Maria and West Riverside Mountains to the southeast of the project area, and the valley axis possesses an extensive sand sheet with limited barchanoid and coppice sand dune systems. These are largely inactive at present, and do not represent sediments that would have high or moderate paleontological potential. Fossil finds in dune sands are limited sandstone representing the ancient dune sands of the Mesozoic; Quaternary eolian deposits are not known by this author to contain fossils.

5.8.1.4.3 Holocene Alluvium

Holocene sediments are younger than about 11 thousand years ago, and therefore are typified by weakly developed soils that frequently display an incipient caliche carbonate (CCa) horizon. Otherwise, these sediments can be very similar to older Pleistocene alluvium. They are typified by moderately to poorly bedded sands, silts, and gravels deposited in alluvial fan and valley fill or basin environments. Frequently, it is not possible to determine in a stratigraphic section the exact location of the Pleistocene-Holocene boundary and, as a consequence, it should be assumed that some Holocene sediments may contain facies of late Pleistocene age. In this arid setting, Holocene alluvium is considered to have low paleontological potential.

5.8.1.4.4 Artificial Fill and Previously Disturbed Sediment

During World War II, the RSEP site was part of the Desert Training Center (also known as the California-Arizona Maneuver Area), a complex of airfields and military training camps. Between 1942 and early 1944, the RSEP site was used as a training airfield known as the Rice Army Airfield. An infantry training camp also associated with the Desert Training Center, Camp Rice, is located immediately east of the project site, on public land. Although these facilities were abandoned in the 1950s, construction of the roads and airfield facilities left varying depths of fill and disturbed soil in the area. Artificial fill and previously disturbed sediment would not have fossils in stratigraphic context. Therefore, this sediment has no paleontological potential and is not considered further in this assessment.

5.8.1.5 Paleontological Sensitivity of the Project Site

Paleontological sensitivity is a qualitative assessment made by a professional paleontologist taking into account the paleontological potential of the stratigraphic units present, the local geology and geomorphology, and any other local factors that may be germane. Paleontological potential is the probability that a given rock unit will yield scientifically significant fossils based on its geologic history and physical properties, as well as the available fossil record from that unit. According to SVP (n.d.) standard guidelines, paleontological sensitivity consists of (1) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (2) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data (Table 5.8-1).

TABLE 5.8-1
Paleontological Sensitivity Ratings Employed in this Assessment

Sensitivity	Definition
High	Assigned to geological formations known to contain paleontological resources that include rare, well-preserved, and/or fossil materials important to on-going paleoclimatic, paleobiological and/or evolutionary studies. They have the potential to produce, or have produced vertebrate remains that are the particular research focus of many paleontologists, and can represent important educational resources as well.
Moderate	Stratigraphic units that have yielded fossils that are but moderately well-preserved, are common elsewhere, and/or that are stratigraphically long-ranging would be assigned a moderate rating. This evaluation can also be applied to strata that have an unproven but strong potential to yield fossil remains based on its stratigraphy and/or geomorphologic setting.
Low	Sediment that is relatively recent, or that represents a high-energy subaerial depositional environment where fossils are unlikely to be preserved. A low abundance of invertebrate fossil remains, or reworked marine shell from other units, can occur but the paleontological sensitivity would remain low due to their lack of potential to serve as significant scientific or educational purposes.
Marginal and Zero	Stratigraphic units with marginal potential include pyroclastic flows and soils that might preserve traces or casts of plants or animals. Most igneous rocks, however, have zero paleontological potential. Other stratigraphic units deposited subaerially in a high energy environment (such as alluvium) may also be assigned a marginal or zero sensitivity rating. Manmade fill is also considered to possess zero (no) paleontological potential.

Source: Adapted from SVP, n.d.

No paleontological records are known for Rice Valley and no paleontologically sensitive sediments occur in or within 1 mile of the project area.

5.8.2 Environmental Analysis

The environmental impacts on paleontological resources from construction and operation of the RSEP are presented in the following sections.

5.8.2.1 Paleontological Resource Significance Criteria

In its standard guidelines for assessment and mitigation of adverse impacts to paleontological resources, the SVP (n.d.) notes that an individual fossil specimen is considered scientifically important and significant if it is: (1) identifiable, (2) complete, (3) well preserved, (4) age-diagnostic, (5) useful in paleoenvironmental reconstruction, (6) a type or topotypic specimen, (7) a member of a rare species, (8) a species that is part of a diverse assemblage, or (9) a skeletal element different from, or a specimen more complete than, those now available for that species. For example, identifiable land mammal fossils are considered scientifically important because of their potential use in determining the age and providing input to paleoenvironmental reconstructions for the sediments in which they occur. Moreover, vertebrate remains are comparatively rare in the fossil record. Fossil plants are also important in this regard and, as sedentary organisms, are actually more sensitive indicators of their paleoenvironment and, thus, more important than mobile mammals for paleoenvironmental reconstructions. For marine sediments, invertebrate fossils, including marine microfossils, are scientifically important for the same reasons that land mammal and/or land plant fossils are valuable in terrestrial deposits. The value or importance of different fossil groups varies depending on the age and depositional environment of the stratigraphic unit that contains the fossils, their abundance in the record, and their degree of preservation.

Using the criteria of the SVP (n.d), Riverside County (Riverside County, 2009a), and the sensitivity ratings provided above, the significance of potentially adverse impacts of earth moving on the paleontological resources would be assessed. Any unmitigated impact on a fossil site or a fossil-bearing rock unit of high or moderate sensitivity would be considered significant.

5.8.2.2 Paleontological Resource Impact Assessment

Because no paleontological records are known, and no paleontologically sensitive sediments occur within the project area, no impacts to paleontological resources would occur from subsurface excavations associated with construction of the RSEP and its offsite lateral. No impacts to paleontological resources are expected from the operation of the RSEP.

5.8.3 Cumulative Effects

Widespread recent development in western Riverside County has resulted in proportionately extensive impacts to paleontological resources in that area, but this has not been the case in the vast eastern desert portion of the county. The potential contribution to cumulative effects to paleontological resources from project-related ground disturbance would be nil, given the low probability of encountering these resources. Thus, the proposed

RSEP would not contribute to cumulative effects to paleontological resources in the absence of mitigation.

5.8.4 Mitigation Measures

Guidelines for the Implementation of the California Environmental Quality Act (CEQA, Public Resources Code Sections 15000 et seq.) include among the questions to be answered in the Environmental Checklist (Section 15023, Appendix G) the following: "*Would the project directly or indirectly destroy a unique paleontological resource or site*?" and "*Does the project have the potential to . . . eliminate important examples of the major periods of California . . . pre-history*?" These questions are answered in the negative based on the data and considerations provided above. Because construction of the RSEP will not have adverse impacts on significant paleontological resources, mitigation measures are not necessary.

5.8.4.1 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts on paleontological resources are anticipated as a result of the construction and/or operation of the RSEP because no impacts to paleontological resources are anticipated to result from project implementation.

5.8.5 Laws, Ordinances, Regulations, and Standards

Paleontological resources are non-renewable scientific resources and are protected by several federal and state statutes (California Office of Historic Preservation 1983; see also Marshall, 1976; Fisk and Spencer, 1994), most notably by the 1906 Federal Antiquities Act and other subsequent federal legislation and policies, and by State of California's environmental regulations (CEQA, Section 15064.5). Professional standards for assessment and mitigation of adverse impacts to paleontological resources have been established by the SVP (n.d.). Design, construction, and operation of the RSEP will be conducted in accordance with all LORS applicable to paleontological resources in the context of this project. Federal, state, and local LORS applicable to paleontological resources are discussed briefly below, along with professional standards for paleontological resources assessment and impact mitigation.

5.8.5.1 Federal LORS

Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (PL 59-209; 16 United States Code 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. In addition, the National Environmental Policy Act of 1969 (United States Code, section 4321 et seq.; 40 Code of Federal Regulations, section 1502.25), as amended, requires analysis of potential environmental impacts to important historic, cultural, and natural aspects of our national heritage. Federal protection for significant paleontological resources applies to the RSEP because construction of the project transmission line affects federally owned or managed lands, and because federal entitlements and other permits are required for project implementation. Although the RSEP transmission line will be located on federal land managed by the BLM, no impacts to paleontological resources will result from construction or operation of the line. Therefore, no federal LORS are applicable to potential impacts to paleontological resources resulting from the RSEP project.

5.8.5.2 State LORS

5.8.5.2.1 California Environmental Quality Act

The CEC environmental review process under the Warren-Alquist Act is considered functionally equivalent to that of CEQA (Public Resources Code Sections 21000 et seq.). CEQA requires that public agencies and private interests identify the environmental analysis of their proposed projects on any object or site of significance to the scientific annals of California (Division I, California Public Resources Code: 5020.1 [b]). *Guidelines for the Implementation of CEQA* (Public Resources Code Sections 15000 et seq.) define procedures, types of activities, persons, and public agencies required to comply with CEQA. Appendix G in Section 15023 provides an Environmental Checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts. One of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section V, part c) is the following: "Would the project directly or indirectly destroy a unique paleontological resource or site…?"

Although CEQA does not define "a unique paleontological resource or site," Section 21083.2 defines "unique archaeological resources" as "…any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information
- Has a special and particular quality such as being the oldest of its type or the best available example of its type
- Is directly associated with a scientifically recognized import prehistoric or historic event

This definition is equally applicable to recognizing "a unique paleontological resource or site." Additional guidance is provided in CEQA Section 15064.5 (a)(3)(D), which indicates that "generally, a resource shall be considered historically significant if it has yielded, or may be likely to yield, information important in prehistory or history."

Section XVII, part a, of the CEQA Environmental Checklist asks a second question applicable to paleontological resources: "Does the project have the potential to …eliminate important examples of the major periods of California history or pre-history?"

To comply with CEQA, impact assessments must answer both these questions in the Environmental Checklist. If the answer to either question is *yes* or *possibly*, a mitigation and monitoring plan must be designed and implemented to protect significant paleontological resources.

The CEQA lead agency having jurisdiction over a project is responsible to ensure that paleontological resources are protected in compliance with CEQA and other applicable statutes. The lead agency with the responsibility to ensure that fossils are protected during construction of the proposed RSEP is the CEC. California Public Resources Code Section 21081.6, entitled Mitigation Monitoring Compliance and Reporting, requires that the CEQA lead agency demonstrate project compliance with mitigation measures developed during the environmental impact review process.

Based on these considerations, it is evident that the CEQA process as implemented by the CEC under the Warren-Alquist Act does apply to paleontological resources that may be affected by the RSEP.

5.8.5.2.2 California Public Resources Code

Additional state requirements for paleontological resource management are stated in California Public Resources Code Chapter 1.7, Section 5097.5 (Stats. 1965, c. 1136, p. 2792), entitled Archaeological, Paleontological, and Historical Sites. This statute defines any unauthorized disturbance or removal of a fossil site or remains on state-owned public land as a misdemeanor and specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources. This statute would apply to the RSEP project only if any construction or other related project impacts occur on state-owned or state-managed lands or if the state or a state agency were to obtain ownership of project lands during the term of the project license. The RSEP is not located on state-owned lands and hence the requirements set forth in this code to not apply.

5.8.5.3 Local LORS

The draft Open-Space Element of the Riverside County General Plan contains the following policies:

> OS 19.12 Whenever existing information indicates that a site proposed for development may contain biological, paleontological, or other scientific resources, a report shall be filed stating the extent and potential significance of the resources that may exist within the proposed development and appropriate measures through which the impacts of development may be mitigated.
>
> OS 19.13 This policy requires that when existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor site grading activities, with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate repository, and file a report with the Planning Department documenting any paleontological resources that are found during the course of site grading.

Neither policy applies to the RSEP because no paleontological resources are in the vicinity of the proposed project.

5.8.5.4 Applicability of LORS to Paleontological Resources

Federal, state, and local LORS applicable to paleontological resources and pertaining to this proposed project are summarized in Table 5.8-2.

5.8.5.5 Professional Standards

The SVP, an international organization of professional paleontologists, has established standard guidelines (SVP, n.d.) that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys; monitoring and mitigation; data and fossil recovery; sampling procedures; and specimen preparation, identification, analysis, and curation. Most practicing paleontologists in the nation adhere to the SVP's guidelines,

TABLE 5.8-2
Laws, Ordinances, Regulations, and Standards for Paleontological Resources

LORS	Applicability	Project Conformity	AFC Section Explaining Conformance
Antiquities Act of 1906	Applicable—Federal land is involved, and a federal entitlement will be required, for the transmission corridor	Yes	5.8.2, 5.8.3
CEQA, Appendix G	Applicable—Paleontological resources are listed as environmental components subject to CEQA review.	Yes	5.8.2, 5.8.3
Public Resources Code, Sections 5097.5/5097.9	Not applicable—Applies only to state-owned land, and none are affected by this project	NA	5.8.2.2
Riverside County 2009 General Plan Update	Applicable—The Resources Conservation and Open Space Element dated 2009 addresses paleontological resources	Yes	5.8.2, 5.8.3

NA = not applicable

and extend those to address other types of fossils of scientific significance, such as invertebrate fossils and paleobotanical specimens. Many federal and state regulatory agencies, including the CEC, have informally adopted the SVP standard guidelines.

5.8.6 Agencies and Agency Contacts

There are no agencies having blanket jurisdiction over paleontological resources. The CEC has jurisdiction over paleontological resources for this project. BLM and Riverside County (2009a) also acknowledges the occurrence of paleontological resources within their respective jurisdictions and that these resources are afforded protection by the LORS listed in Table 5.8-2. Copies of this paleontological resources assessment should be provided to the appropriate field office of the BLM. Because no resources are present, or are likely to be present, no documentation is required by Riverside County.

5.8.7 Permits and Permit Schedule

No permits regarding paleontological resources will be required because no resources are present within the project vicinity.

5.8.8 References

California Energy Commission (CEC). 2000. Paleontological Resources: in Regulations Pertaining to the Rules of Practice and Procedure & Power Plant Site Certification. 3 p. Sacramento, CA.

California Energy Commission (CEC). 2007. Paleontologic Resources: in Complete Text of the Energy Commission's Amendments to the Power Plant Siting Regulations, 1 p.

California Office of Historic Preservation. 1983. Summary of state/federal laws protecting cultural resources, 10 p.

Bishop, C.C. 1963. *Geologic Map of California: Needles Sheet* (1:250,000). California Division of Mines and Geology. http://ngmdb.usgs.gov/ngm-bin/ILView.pl?sid=41_1.sid&vtype=b.

Fenneman, N. M. 1931. *Physiography of Western United States*. McGraw-Hill Book Company: New York, NY.

Fisk, L. H., and Spencer, L. A. 1994. Highway construction projects have legal mandates requiring protection of paleontological resources (fossils). *Proceedings of the 45th Highway Geology Symposium*. Portland, Oregon.

Glazner, A.F., J.D. Walker, J.M. Bartley, J.M. Fletcher, et al. 1994. Reconstruction of the Mojave Block. Pp. 3-30 in (S. F. McGill and T.M. Ross, eds.) *Geological Investigations of an Active Margin*. Geological Society of America Cordilleran Section Guidebook, San Bernardino County Museum Association, Redlands, CA.

Jefferson, G. T. 2003. Stratigraphy and paleontology of the middle to late Pleistocene Manix Formation, and paleoenvironments of the central Mojave River, southern California. Pp. 43-60 in (Y. Enzel, S.G. Wells, and N. Lancaster, eds.) *Paleoenvironments and Paleohydrology of the Mojave and southern Great basin Deserts*. Geological Society of American Special paper 368, Boulder, CO.

Marshall, L. G. 1976. "Paleontological salvage and federal legislation." *Journal of Paleontology*. Vol. 50, p. 346-348.

McFadden, L. D., W. B. Bull, and S. G. Wells. 1991. Stratigraphy and geomorphology of Quaternary piedmont deposits. In *The Geology of North America, Volume K-2, Quaternary Non-Glacial Geology: Conterminous U. S.*, edited by R.B. Morrison, pp. 327-331. Geological Society of America, Boulder, CO.

Quade, Jay, M. D. Mifflin, W. L. Pratt, W. McCoy, and L. Burckle. 1995. Fossil spring deposits in the southern Great Basin and their implications for changes in water-table levels near Yucca Mountain, Nevada, during Quaternary time. *Geological Society of America Bulletin* 107:213-230.

Riverside County. 2009a. *County of Riverside General Plan, Draft Multipurpose Open Space Element* (June, 2009). Riverside, CA. http://www.tlma.co.riverside.ca.us/planning/content/ hearings/gpac/gpac061809/new_business/02_Proposed_Cultural_Resources_OS_06_02_09.pdf

Riverside County. 2009b. *Draft Figure OS-8; Paleontological Sensitivity* (map). Riverside, CA. http://www.rcip.org/Documents/general_plan/gen_plan/fig_05_08.pdf.

Sherrod, D. R., and R. M. Tosdal. 1991. Geological setting and Tertiary structural evolution of southwestern Arizona and southeastern California. *Journal of Geophysical Research* 96: 12407-12423.

Society of Vertebrate Paleontology (SVP). n.d. "Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines." http://vertpaleo.org/ society/polstatconformimpactmigig.cfm.